

Astrometric and Photometric Observations of 1996 PW, a Very Eccentric Asteroid

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We have been using the 0.6m reflector of the Jet Propulsion Laboratory at Table Mountain observatory ('I'MO) in Wrightwood, California, to make immediate astrometric and photometric observations (B, V, R, and I filters + CCD) of interesting solar system objects we discover remotely with the fully automated Near Earth Asteroid and Tracking program (NEAT) at the Air Force 1.0 m telescope on Haleakala summit, Hawaii [1]. The limiting magnitudes of these two telescopes are comparable given the short duration (-20s) of the NEAT exposures. On Aug. 9 UT, 1996, NEAT discovered asteroid 1996 PW with apparent motion atypical of main-belt asteroids. It was recognized as unusual. by Gareth Williams at the Minor Planet Center in Cambridge, Massachusetts. We requested further observations by the Air Force Maui Optical Site (AMOS). We also made further astrometric observations with the NEAT telescope on Aug. 12 UT, and with the TMO 0.6m on Aug. 13, 14, and 15 UT. These and the observations of others establish an orbit with perihelion -2.5 AU, and with eccentricity exceeding 0.99 (approaching parabolic). The TMO observations reveal. no coma, and yield reflectance colors (observed/solar) $v-r = 0.175 \pm 0.04$ and $V-1 = 0.335 \pm 0.03$, similar to the reddest known S and D type asteroids. The intrinsic brightness also increased by 0.2 magnitudes (± 0.08) from Aug. 14 to Aug. 15 UT, indicative of rotational variation on a time scale of days. We conclude that 1996 PW is either an extraordinary asteroid that has followed an orbital evolution similar to very long period comets, or else an extraordinarily inactive comet of very long period.

[1] Helin, E. F., et al. (1996) this proceedings.